



WASTE GRADUATION CEREMONY 2007

For almost two years the students of the 5th generation had been waiting for this event, their graduation.

38 students from 23 different countries had decided to take the Master course WASTE in Stuttgart, which had been a quite tough way from the first pre-course on to the Master Thesis and then finally to the graduation.

This festive ceremony took place at IBZ, Vaihingen, on the 22nd of November 2007. Welcoming addresses were held by Professor Bernd Bertsche, Dean of the Faculty of Mechanical Engineering, Program Coordinator Professor Günter Baumbach and Marta Escoto the student representative of the 5th generation.

One highlight of the evening was the speech about the Global Marshall Plan, held by Frithjof Finkbeiner, who is Entrepreneur,



International Coordinator of the Global Marshall Plan Initiative and member of Club of Rome. To the audience he explained the aim of the Global Marshall Plan, which emphasizes having a world in balance. To achieve this ambition we needed a better design of globalization. Mr. Finkbeiner also described the present situation of our world: a world full of discrepancy between the north and the south, poverty, migration, terror, wars, cultural conflicts, and environmental catastrophes. According to the Global Marshall Plan these problems can not be solved nationally but rather by a binding global framework for the world economy.

Further on he demonstrated many options to the students where they might be able to use their acquired knowledge to help decreasing the world's discrepancy. >>> continues

ISWA TEAM SHOWS RESULTS OF RESEARCH PROJECT AT THE H₂O VIETNAM 2007

The "H₂O Vietnam 2007", one important water/wastewater event of South Asia, took place in Ho Chi Minh City (former Saigon) from the 18th until the 21st October.

It was coordinated by the German Federal Ministry for Education and Research. A German delegation shared a stand in order to present results of different research projects. Representing the Universität Stuttgart, researchers of the Institute for Sanitary Engineering, Water Quality and Solid Waste Management (ISWA) showed the final results of the project "Application of Trickling Filters under Different



Country-Specific Influence Factors", which ran within the cooperative project "Export-oriented Research and Development in the field of Wastewater Treatment". A poster and a trickling filter model were prepared especially for this, furthermore the project was presented in details

on the exhibition's symposium at the 19th of October. The trickling filter model, along with filling materials of the cooperation partner 2H-Kunststoff GmbH, proved

to be an effective eye-catcher. Among the visitors were executives of international engineering companies, Vietnamese students and the Vietnamese vice-minister of Science and Technology.

The good response of the visitors as well as the interesting exchange of experience was very positive for the ISWA. Besides many questions were asked concerning the possibility

of studying at the University of Stuttgart. As most of the visitors were interested in courses in English, the flyers of the international master-programs ran out quickly on the second day. Perhaps we can expect Vietnamese colleagues at WASTE in the next years!

• Fabio Chui Pressinotti, M.Sc.

News and announcements

AWARD FOR IOSIF MARIAKAKIS FROM THE WASTE-GENERATION 2005

In course of the "82. Siedlungswasserwirtschaftliches Kolloquium" held on 11 October two outstanding theses, written by M.Sc. Iosif Mariakakis from the WASTE generation 2005 and Dipl.-Ing. Christian Kocher respectively, were commended with a prize sponsored by Ingenieurgesellschaft Nussbaum. Congratulations!

Mr. Iosif Mariakakis, what motivated you to analyze the "Modelling of a trickling filter with focus on biofilm processes"?

IM: "Trickling filters are attached to growth biomass reactors, which are operated for more than 100 years in the field of wastewater treatment. Under circumstances they exhibit significant advantages such as low investment and operational costs, simple operation, better sludge thickening, good recovery after shock toxic loads. Until now dimensioning and operation of trickling filters has been based on practical experience, e.g. ATV-DVWK, A-281 (2001), that can guarantee a sufficient efficiency, but incorporates difficulties for the design optimization and risks when extrapolating the conditions outside the range of experience. For

other biological treatment process mathematical models have already been proposed, e.g. Activated Sludge Models (ASM-1, -2, -2a, -3). The developer of the activated sludge models, the International Water Association



(IWA) has recently released some proposals concerning the mathematical modelling of biofilm systems. Scope of the Master thesis was the implementation of these suggestions in order to simulate the trickling filter operation. Aim of the thesis was the assessment of the extent of applicability of such a model for trickling filters."

Was your work part of a research project conducted to ISWA?

IM: "The master thesis was part of an experimental project conducted by ISWA at the Sewage Treatment Plant for Research and Education of Universität Stuttgart. A pilot-scale trickling filter reactor was operated for over than two years in order to study its municipal wastewater treatment capabilities at high temperatures. The project was supervised and carried out by Fabio Chui Pressinotti, M.Sc., scientific assistant at the chair of Sanitary Engineering and Water Quality Management, field of Wastewater Technology. The data acquired during this research have been used for the development of the model of the current Master thesis."

Who do you think could benefit from your research work?

IM: "This Master thesis is meant to contribute to trickling filter design and operation optimisation. The mathematical model developed may be used for testing the effectiveness of a wide range of operating strategies of trickling filters whether they are already built or still in the concept phase. In this way, time, cost and risk of implementing all strategies can be saved. Thus, it is a valuable tool for those engaged in wastewater treatment design."

• Julius Ranghieri

>>> GRADUATION CEREMONY

The following speech "WASTE: More than a study program, a once in a life-time experience" of the student representative Marta Escoto de Tejada gave a very impressive review about the last two years. Then two graduates, Parik Sirumapea on the guitar and Imelda Leiwakabessy as vocalist, presented their song about the friendships they made here in Germany.

Finally Professor Bertsche congratulated each graduate personally and handed over their WASTE Diploma. From now on every graduate could call himself a Master! This called for a celebration. Every one enjoyed the delicious dinner prepared by the students of the 6th generation, spent the rest of the evening with reminiscing their time in Stuttgart, talking about their future plans, or just having fun on the dance floor.

• Sarika Wahi

NEWS AT THE WASTE-OFFICE

At the beginning of the winter semester 2007/2008 Mr. Adolf Neuwirth started contributing part of his time to the management of the WASTE Examination Office. He studied Process Engineering and has been working in the Department of Prof. G. Baumbach at IVD in the research field of indoor air pollution.



• Adolf Neuwirth

NEW WASTE-OFFICE-HIWIS

We would like to introduce us - the new "WASTE-Office-Hiwis". We are the new faces behind the info@waste.uni-stuttgart.de address. Our motto: there are no stupid questions.



Tobias Bunk, Sarika Wahi, Mona Mutz, Stefan Siepe

Matthias and Julius left the office this year for studying abroad. So we organise lots of things around the WASTE program, take care of your problems and look after the WASTE-Website.

Although we don't really know each other, we would like to get to know you. So if you walk alongside our door come in and have a little chat with us.

• WASTE-Office

DATES TO NOTE

- Waste Intercultural Meetings "WIM" at 5.30 p.m. on 4 Dec., 15 Jan., 12 Feb.
- 14 December: Solid Waste excursion
- 22 Dec. - 6 Jan. 08: Christmas Holidays
- 15 February 2008: Application deadline
- for 7th generation starting in Sept. 2008
- Sept. 2008: Arrival of 7th generation
- 13 October 2008: Start of lecture period
- 20 Nov. planned: Grad. Ceremony 2008

Studying WASTE

SOLID WASTE EXCURSION - WASTE SOLUTIONS

Dr. Fischer, lecturer of the "Solid Waste Management" course, organized a waste field trip on the 8th of June 2007. During the trip different techniques and methods of municipal waste management and treatment were explained and presented.



Fermentation plant at the town of Leonberg:

- Mechanical treatment: sieves, magnets, crushing
- Fermentation under thermophilic conditions
- Biogas collection, treatment, transfer to fuel cells, power generation
- Biofiltration of sucked odors by natural wood chops

Waste collection point in Tübingen: Locals transport their waste by car and discard them into separate containers: glass, furniture, carpets, computers, aluminum, and kitchen appliances.

Landfill for municipal waste:

- The gas is collected through gas wells and transferred to generators to produce electricity.

- Leachate is collected by tubes to a room with three towers of activated carbon.

Compost windrow piles:

Food waste is mixed with green waste into several heaps. The heap is turned weekly in order to keep favorable conditions for degrading microorganisms.



Wastewater treatment plant at Balingen:

The sludge is first treated in a fermentor and then dried on conveyor belts powered by photovoltaic cells reducing water content to 25%. The solids are further degasified and used as minerals in asphalt production.

The end of the trip was a visit to the Hohenzollern Castle.

• Karen Mouarkech

1-YEAR OF WASTE INTERCULTURAL MEETING "WIM"

Ever heard of the lively tune of vallenato from Colombia that can make you feel like dancing or seen the bone-breaking moves of South Korea's breakdance? Have you ever tasted the mouth-watering krupuk of Indonesia or endure the spicy hot home-made kebab from Pakistan, for free? Or be awed by the Ms. Universe beauties of Venezuela or be offered with more interesting sites from Lebanon, and not the bad images portrayed on television? Experience these and many more from Waste Intercultural Meeting (WIM).

WIM is a great opportunity for the WASTE students to convey what their respective countries have, their amazing cul-

tures, the tasty food and a whole lot more of things that you have not heard before. This intercultural meeting initiated by the



WASTE 5th generation is done for more than one year now, thanks to the support and enthusiasm of the students. Many countries had been presented already, each of them leaving a good impression on what their nations have to offer.

Never miss this chance for a first-hand information about the different countries around the globe in the evening of the first Tuesday of each month. This might give you a perfect idea for a trip in your next vacation.

• Ria Marni Tubaoan

AIR QUALITY CONTROL EXCURSION TO INFRASERV HÖCHST

Apart from learning the principles and acquiring the knowledge inside a classroom, there are also chances to compare and to experience real life applications developed in Germany. One was the visit to the Industriepark Höchst in Frankfurt, at the end of summer semester as part of our Air Pollution Control lecture. Professor Baumbach showed several industrial applications and real life examples of important topics, which was discussed throughout his lecture. During this trip not only industrial facilities were visited but also other phenomena related with the dispersion of air pollutants in the atmosphere, such as inversion layers which were observed while travelling along the autobahn on our way to Frankfurt. And the analysis of the smoke plumes from stick pipes gave us certain information about the atmospheric dispersion conditions on that day.

Although the policy of the industrial park forbade us to take pictures, the welcoming meeting and presentation held by Infracerv Höchst crew, as well as the obtained brochures, provided us a clear explanation of what we were about to see and also a way to remember the visit: a rotary kiln, for high temperature incineration treatment and a fluidized bed sewage-sludge incineration facility were the main topics. Once we finished this meeting we went to see the facilities of the industrial park in a normal working day. Of course the safety is a main issue in any industrial plant, so we wore the required safety devices. The different components of the incineration systems were shown, as well as their control rooms, where we could take a look at the overall processes being carried out, in fact we could even take a look at the coal used as a fuel to feed them which turn out to come from different places around the world, including native countries of some M.Sc. WASTE students.

From the welcome presentations until the great lunch we had, the visit to Industriepark Höchst was a comprehensive experience that ratifies that theory and empirics always complement each other. It was really helpful in order to visualize some of the topics discussed in the classroom and also to have a look at next topics that are studied in deeper in the following semester, making it easier to understand and providing the students with an extra motivation to keep doing their best.

• Pavel López

SWEDEN SUMMER CAMP

Before I travelled to Sweden in August 2007 to participate in the annual Bioenergy and Renewable Energy summer courses at the University of Halmstad, I considered the financial implications and potential "lost" work on my thesis. When I told my friend and fellow WASTE student - Olakunle Olatunji, about my doubts, he said, "If you think education is expensive, try ignorance".

The 22 other students in the courses came from 9 countries: Austria, Germany, Columbia, Mexico, Italy, the Czech Republic, Slovenia, Indonesia and Sweden. Accommodation was free, an EU Government feeding allowance was provided, and bicycles were provided to ease transportation.

The lectures started by 9am and ended at 4pm each day. After lunch, we solved calculation problems based on the mornings' lectures, and worked on the course



group projects. At the end of each course, we wrote an examination, obtained our results soon after, and made presentations of our projects.

We made instructive study-visits, and took guided tours of a hydro-electric power plant, a waste collection and combined heating power (CHP) plant, a solar power generation farm, wind power generation



farms, and a nuclear power plant, where we obtained detailed information about the contributions the facilities made towards satisfying the energy needs of the towns depending on them for heating and electricity.

The lectures discussed the environ-

mental, technical, legal and economic issues peculiar to power generation in Europe, and the projects tested the knowledge we had gained from the Bioenergy and Renewable Energy courses:

For the Bioenergy project, we designed 250.000 kWh power plants fuelled by biomass from cattle, grain and forest resources, and analysed their environmental impacts.

For the Renewable Energy project, we assessed the energy demands in chosen countries, selected renewable energy sources feasible in those countries, and designed power plants which would meet the goals of the Kyoto-Protocol.

Overall, I spent an enlightening month in Sweden, and I think more WASTE students should attend the courses to experience the practical applications of WASTE lectures, gain a better understanding of the environmental problems plaguing the planet, and gain useful skills for solving them.

• Oahimire Ejakhegbe

Recent events

WASTE SUMMER PARTY 2007

This year we had the famous WASTE Summer Party the fourth time in series! After many meetings and lots of preparation the evening was quickly coming together. Students started setting up tents, tables and music and decorations got installed.

The WASTE Students are not only known as working hard in class, as they showed all of their culinary knowledge by bringing self made traditional plates from all over the world.

After the opening speech of Prof. Baumbach people were having fun sitting together, talking and laughing while they ate the great meal.

But if you thought that was all you got it wrong! Students presented an enormous poster, made from pictures of their

home countries and were having fun while



enjoying the self made Caipirinhas. To get people active, the water balloon fight was a nice activity and helped to cool down in the hot summer night. Visitors proved their ar-

tistic skills by painting little pieces of a big picture while not knowing what the final complete image would look like.

As it was getting dark the dance floor attracted more and more students, motivated by a Salsa dancing introduction, soon almost everyone was moving to the Latin rhythms. People who felt like sitting out watched the dancers from the Oriental styled relaxing area, decorated with water pipes and comfortable seats.

Everyone seemed to be happy to have come to this nice get-together, which was only possible through the help of lots of people and the financial support of the WASTE Club. This event is certainly not to be missed next summer!

• Stefan Siepe



Life after WASTE

Hello everybody,
I was invited to write on this Newsletter about my career path after my studies in the M.Sc. Program "Air Quality Control, Solid Waste and Waste Water Process Engineering". I thank the great team of the program for the invitation, and here we go.

Well, let us start with the introduction, my name is León Javier Zenteno Tovar, I was born in Mexico and studied Chemical Engineering with specialization in Process Optimization. Right now I work in Austria for General Electric Energy in GE Jenbacher, the division of Gas Engines, as Product Design & Development Engineer. What exactly does it mean?... it means to work in one of the biggest and most prestigious companies in the world with more than 300 000 colleagues world wide. In my division, with 1 400 persons, we are in



charge to produce gas engines to generate power and heat with 4 MW output. The company is expanding strongly to China, India and Latin America.

My responsibilities in the Fuel & Exhaust Treatment Group are to develop, optimize and design technology for tre-

ating the exhaust gases from the engines. The challenge in this position is to make the technology high effective to fulfil the strict requirements from several countries keeping the investment within the market standards. Therefore I work very close with other R&D groups like Thermodynamics, Control Systems, Plant Constructions, Simulations and Test Bench; and also with other departments like Quality, Production, Sourcing, Services and Product Management. One day I may be working with 20-years experienced technician, an expert in system programming, engineers in components developing or be cooperating with our partners in countries like United States and Italy or be deciding in a meeting the security requirements of such technology or be travelling to countries like Netherlands, Germany or Italy for making tests.

Developing of plants is a challenging task that needs creativity, curiosity, resources and most of all technical knowledge. Part of my job is to identify the up-dates

of technologies, to integrate the customer's expectations and the international and local regulations in the product design process. Finding the optimized output of mixing all these together is my task.

And what the M.Sc. Program has to do with all this?... from WASTE and my work at the Institute of Process Engineering and Power Plant Technology (IVD) I acquired a deeper knowledge in Environmental and Process Engineering, which is the base of my job at General Electric Jenbacher. During my Master's Thesis and my former activities in the IVD I related myself with the Power Generation and Combustions Processes areas by developing plants with Catalytic Plasma and CO₂ Capture.

I encourage the actual and future students during and after their studies to get involved in generation of technology which will lead to how the process will be done in the next decades. If you are curious and like to imagine, solve, build and lead I recommend you to visit the next link: www.gejenbacher.com or www.gecareers.com

• León Javier Zenteno-Tovar

My name is Jian Chen, I was student of the first WASTE course and graduated in 2003. After my graduation I got a chance to do an internship at Daimler Chrysler in Stuttgart for 6 months. The experience of studying and working in Germany was fruitful and I learned not only everything about the topics of our courses, but also how to be part of a team in a German company and the German language from which I benefit a lot.

I came back to China in 2004 and joined Bosch (China) Investment Ltd. in March 2005. Bosch is one of the biggest German companies worldwide and Bosch China plays an important role in China as well as in Asia-Pacific. I am working for the headquarter of all Bosch business units in China. It has around 250 employees among



which one-fifth are German.

My first working experience was in IT department and I was a team member of the program office of IT Asia-Pacific.

My major task was supporting the Asia Pacific IT Director of Bosch in project management. Though my task had nothing to do with environmental engineering, I enjoyed it and got to know the way of working, which is quite disciplined, with high expectations.

In August 2007 I was transferred to a new department which became the technical pool of the corporate purchasing as the IT headquarter has been moved to Singapore. I found that the working style in the new department was different to the old one, and I am learning again many new things. One of my major responsibilities is the ISO 9001 Audit. I am

working together with my colleagues on preparation for the audit. I like this quality management topic because it is related to my previous work experience. Of course practice is needed to be an internal auditor and it has been planned.

For me the important thing is always to learn something new and in this way I can enjoy my work. Apart from this, language skill is a big advantage in a foreign company like Bosch. Although English is the working language, German is the most often spoken language here besides Chinese. Many German colleagues are even from Stuttgart where the headquarter of Bosch is located. In a word, it is really fun working in such an international team. Some of my classmates from WASTE and WAREM are also working in foreign companies here in Shanghai, the experience of studying at Universität Stuttgart is important and valuable for us.

• Jian Chen

JENNY ROJAS AT SIEMENS IN ERLANGEN, GERMANY

It is already eight months ago since I got my Master of Science title. Eight months that passed really fast. Since April this year I am working for Siemens in Erlangen. The connection between Siemens and Environment is not that obvious, but it is confirmed that "Environmental Issues" besides being of importance for our societies, can also constitute a lucrative business.

I would say that my career at Siemens starts in the WASTE Excursion to IFAT 2005 (International Trade Fair for Water - Sewage - Refuse - Recycling). There I got a quick inside into the international market for environmental solutions. I experienced that Siemens was already active in this market with some brands like Illinois Water Treatment, Envirex, Memcor, Permutit, Stranco, USFilter, Wallace & Tiernan, Zimpro, among others. Then I saw the chance to achieve some of my goals at that moment: to write my master thesis within an industrial field and to open professional chances for the future.

I wrote my master thesis about the application of membrane technology in the pulp and paper industry. I was in the right place and at the right moment to find a business in expansion process. After fi-

nishing my master thesis I was taken by Siemens to assist the young "Water Team" in developing environmental solutions for the pulp and paper industry. My first tasks met my expectations in the field of detail engineering. I participated actively in designing the first Membrane Bioreactor wastewater treatment plant (currently in construction) for the paper industry in



Germany. Learning was and is still a daily topic. Pipelines, pumps, valves, fittings, instrumentation and construction materials were the first headache. It caused panic at the beginning because I realized that I knew nothing. But once the panic was gone

I came back to old manuscripts, books, etc. It worked. Exciting and boring tasks were part of the way, but the plant is now in construction and that is a nice feeling.

After some months I got a challenging task: to prepare a technical offer for an international bid. A "bit" more responsibility made the job exciting and gave new perspectives to my professional development.

The bid is in process and its realization would be a great chance for my career.

The balance looks positive even though I found some barriers in the way, barriers that looked like that but at the end are thought for learning and growing. I am very satisfied with this experience and with all my experience in Germany: new culture and language, new way of thinking, new way of working, new great people. WASTE was an excellent bridge to these opportunities and I am really thankful for having had the chance to join this family. After some time, even after the exams I had forgot almost everything, but what

I will never forget is the great time that I spent in Stuttgart with unique classmates, professors, administration staff and just nice people. I send a really friendly, thankful and respectful hug to all of them.

• Jenny Rojas

Funny stories

LUDWIGSBURG PALACE



My name is Pu Wang, please call me Winne pooh, ^:^^ . I went to Ludwigsburg on 28th of October just for visiting the Ludwigsburg Palace. To my surprise there was a pumpkin market on that day, thousands of tons of lovely pumpkins were shown there. Why lovely? Just look at these pictures.

• Pu Wang



UNFORGETTABLE NIGHT IN REEPERBAHN HAMBURG

When you are energetic and like night activities, the Reeperbahn is the best place to go at night in Hamburg. I went to Reeperbahn with my neighbors at my last day in Hamburg. We went to a club, called



"Hallo". I took my jacket in a cloakroom of the club and got a ticket which was printed the number for my jacket. Then, we danced

and had great time. When it was time to leave I found out that I lost the ticket. At the beginning, I thought I could enter the cloakroom and find my jacket. Oh no! it was such a naïve idea. The lady who was in charge refused to let me go inside the room and strongly demanded us to show the ticket for my jacket. Later on, she got angry and refused to talk with us. Finally, we called the manager of the club and he got in the cloakroom and found my jacket. The manager asked for my student ID and for one of my neighbor's ID for proofing to check that I was the right owner for the jacket. The manager exclaimed "If anyone would have got the ticket, my jacket could have been given to the person." What a day!!! What a mess. We spent one hour to succeed getting my jacket back. It was a weird and unforgettable night in Hamburg.

• Bong Yong Lee

THE HEAT WITHIN THE COLDNESS

The feeling of being a fan of a football club was never boiled in me. But the opportunity came on the Saturday October 27th, when five "normal" persons got together in what we thought that would be a "normal" game. Although we were not born



here, this city feels like home to us, and because of that, we needed to support the VFB Stuttgart team, but as I said before, we were normal. The game was full of goings and comings from both teams, even some times, we suffered equally or even more than the Stuttgarters, when the Bayern Leverkusen approached the goal. The game was fear for both, but when you have the

chance to be in the right place at the right moment, you have to take advantage of it, and that's what Beck (Stuttgart's player) did, when that happens, the whole stadium just explodes! And with it, the normal people... the suffering became then joy, and the ecstasy came to all fans, even the naturals or the adopted, and by the way did I mention we had the advantage of being in the middle of the club's fan???. The experience of becoming a fan, was then, honestly fabulous, to be in between a same feeling, with no need to speak German or English or any other word but Tooooo! (Goal!). The faces of everyone, were just full of approval and satisfaction, also were ours, that we went to see the VFB to win, and they didn't let us down. I will remember that day, as the day, we lost our normality, and felt the heat within the coldness.

• Carlos Azucena

VISIT TO MUNICH

We decided to visit Munich for one day, taking advantage of the cheap price for groups that travel on weekends. The idea was to wake up as early as possible, take the first train and come back late at night. When we arrived there, we hurried to enjoy our time in the city, so we visited the Deutsches Museum, Marienplatz and its surroundings, Nymphenburg Palace, Olympic Park, BMW Museum and the Allianz Arena. By that time everything was perfect, and we were glad about having done a lot in one day, but then we realized that we had forgotten something: we hadn't checked the schedule of the trains back to Stuttgart. We didn't worry much as it was half past seven, but when we arrived to the main train station we found out that the



last train to Stuttgart was already gone...!

What to do? We asked about student hostels and went directly to register in any of them, but imagine our faces, after a long time of walking and searching... there was not a single bed available for us. Everything was fully booked for the weekend. Although a little upset about that sudden change of plans, we then tried to enjoy more of what the city offered and went to the Hofbräuhaus, one of the most famous Bavarian places, and enjoyed its excellent beer. Then we went to eat at the train station and waited for the next train, which was scheduled for 5:45 a.m. Since it was only two o'clock in the morning we had to spend almost four hours in the waiting room for passengers - of course we tried to sleep, but the chairs of a waiting room are not designed for that, and it became completely impossible when a drunk man arrived and started talking to everybody in the room.

In conclusion, that was how we took advantage of our "troubles" and visited one of the most beautiful places I've ever been, for that reason now I can tell that if there's a place where missing a train is a good option, that has to be Germany!

• Pavel Lopez

The WASTE Club Stuttgart e.V.

MERCEDES-BENZ MUSEUM EXCURSION

On October 16th, the WASTE Club organised an excursion to the Mercedes-Benz Museum. All of us came with a lot of expectations because we were having a special tour called "Technical Fascination" that was not open to visitors all time. First we obtained an audio guide system, which is free of charge in 5 languages and in one and a half hour, we got to know the history of the firm "Mercedes Benz".



We completed our visit with the special section called „Technical Fascination“ that invites one to see the ways in which automobiles are designed as well as how engineers work daily to look toward the

future. The guide in the laboratory showed us future techniques for driving cars. For instance, automobiles in the future will not have steering wheel, they will have a central joystick. Another innovation is that each of the wheels will have a greater range of movement and individual turning radius. Additionally, we also saw the design of the control-board of controls and electrical part of the automobiles. Moreover, the guide explained about the sounds produced when the automobiles were driven (test car with internal sounds). The experience was totally amazing. While some of us were listening to the different sounds produced in the test car, the others were looking at the type of materials from which automobiles are constructed. In the last part of our visit to the laboratory, we saw clay models portraying the steps for designing a new version of an aerodynamic car.

The excursion was incredible and all of us hope to go back to the museum because the experience will be better each time. I suggest to students of WASTE Program to visit Mercedes-Benz Museum before leaving Stuttgart.

• Carlos A. Pacheco



Where to go in Europe?

GREECE - HELLAS

The real name is Hellas (Ελλάδα)!

Regarded as the cradle of western civilization and the birthplace of democracy, Western philosophy, the Olympic Games, western literature, political science, major scientific principles and drama including both tragedy and comedy, Greece has a particularly long and eventful history and a cultural heritage considerably influential in Northern Africa and the Middle East, and fundamentally formative for the culture of Europe and what may be called the West. Modern Greece is a developed country and a member of the European Union since 1981. Athens is the capital. The population of Greece is 10.688.070 and



is located at the southeast end of Europe with a Mediterranean Climate and Greek Orthodox religion. Greece has been through a lot of wars including against the Ottoman Empire, the Greco-Turkish war, the Greco-Italian war, the Germans in the WW2 and a civil war. She had many wounds, but has recovered with the years.

Now Greece is a very popular historic destination because of the famous Parthenon and the Acropolis, the ancient Olympia and many other things. As it is one of the best destinations for summer vacations, so if you love summer, beaches, night life, you can visit Hellas!!!

• Natalia Tziveni

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